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October 31, 2016

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Business Data Services in an Internet Protocol Environment, WC Docket No. 16-143; Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25 and RM-10593

Dear Ms. Dortch:

There is no need for the Commission to mandate a discounted rate for ILEC wholesale Ethernet service and no factual or legal basis for the Commission to do so.[1] Windstream[2] would have the Commission apply a wholesale discount to all ILECs nationwide because it claims they have market power over Ethernet. While the compromise framework Verizon and INCOMPAS developed earlier this year acknowledged some markets are more competitive than others—and proposed price regulation for business data services in markets where competition is insufficient to discipline prices—no provider has the nationwide market power Windstream ascribes to ILECs. Facilities-based providers compete to offer Ethernet services, and Windstream's proposal to regulate ILECs' wholesale rates would likely harm customers. It also conflicts with the Commission's deregulatory, provider-neutral approach to business data services. The Commission should reject it.

As the accompanying Declaration of J. Gregory Sidak (Attachment A) details, Windstream's proposed "Pricing Parity Standard" for wholesale Ethernet services is based on a series of errors. Among them:

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[1] Windstream's proposal to mandate a discount between wholesale and retail prices finds no support in any provision of Title II of the Communications Act, including Sections 201, 202, 251(c)(4), or 251(b)(2). *See* Letter from Curtis L. Groves, Verizon, to Marlene H. Dortch, FCC, WC Docket Nos. 16-143 & 05-25; RM-10593, at 1-2 (Oct. 14, 2016).

[2] *See* Ex Parte Letter from John Nakahata, Harris, Wiltshire & Grannis, LLP, Counsel for Windstream, to Marlene Dortch, FCC, WC Docket Nos. 16-143, *et al.* (Oct. 6, 2016) ("Windstream Oct. 6, 2016 Ex Parte").

- In the marketplace for Ethernet services, neither the ILECs nor any other provider has the nationwide market power Windstream assumes all ILECs have.
- The Efficient Component Pricing Rule (ECPR) on which Windstream's proposal depends is not relevant to the Ethernet marketplace, because ILECs are not the Ethernet market leaders Windstream presumes them to be.
- Windstream's price squeeze arguments ignore the presence and economic significance of facilities-based competitors. Price squeezes generally only raise competitive concerns if a provider can benefit from driving others out of the market. The presence of facilities-based competitors for Ethernet ensures that no such harm is likely to occur.
- Windstream does not consider the effect of losing a retail customer on ILECs' revenue from complementary products, and as a result it misstates the purported efficient wholesale price.

In addition, Windstream's proposed rule is unworkable, requiring administratively burdensome studies and arbitrary distinctions between wholesale costs and retail costs. And it conflicts with the Commission's intended framework for Ethernet services.

I. The Market Conditions Needed To Justify Windstream's Proposed Wholesale Discount And the Economic Theory Underlying It Do Not Exist.

Relying on unfounded assumptions, Windstream claims the Commission should mandate that the price of an ILEC's wholesale Ethernet service must be less than the lowest price it offers for a like retail service. Without support, Windstream assumes a marketplace where "market leaders" use "market power" and control "bottleneck last-mile facilities." Windstream claims there is a "lack of competitive alternatives" for Ethernet, and it assumes these circumstances exist in every market.

But the Ethernet marketplace doesn't function the way Windstream describes it. Although some markets are more competitive than others, neither ILECs nor anyone else has pervasive market power in all markets nationwide. And there is no evidence in the record to support a conclusion that every market has a market leader with market power, or that an ILEC is the market leader in each community. In fact the Commission has not found any particular Ethernet provider has market power in any market.

To the contrary, according to the Fact Sheet, [3] the draft Order does not treat any Ethernet provider in any market as if it has market power. It would exempt all Ethernet providers from dominant-carrier requirements and acknowledges that investment and competition for Ethernet

[3] *See* Fact Sheet, "Chairman Wheeler's Proposal To Promote Fairness, Competition, and Investment in the Business Data Services Market," at 3, http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db1007/DOC-341659A1.pdf (Oct. 7, 2016) ("Fact Sheet").

services has steadily grown under a light-touch regulatory regime. [4] And it grants "uniform forbearance" from dominant-carrier regulation for all Ethernet providers. [5]

Where providers do not have market power and do not control bottleneck facilities, Windstream's proposed wholesale discount is unjustified, and the economic theory supporting Windstream's proposal is inapposite. That proposal is based on the ECPR, a theory that posits that it is efficient to set the price of access to an essential facility at "the input's direct per-unit incremental costs plus the opportunity cost to the input supplier of the sale of a unit of input." [6] Dr. Willig, who filed a declaration on behalf of Windstream, is one of the founders of this theory.[7]

But for several reasons, including the absence of market power, the ECPR theory does not support a mandated wholesale discount in the Ethernet marketplace. First and foremost, as Dr. Willig acknowledges in his declaration, this pricing theory was designed for the case of a vertically integrated monopolist.[8] He has said that the ECPR should not be applied indiscriminately. And Dr. Willig opines that where market power exists, it *may* be appropriate to apply ECPR.[9] Windstream, however, would apply the rule to every ILEC Ethernet service, in every geographic market.

Windstream's plea for this new form of prescriptive regulation aimed only at ILECs comes despite the "evidence of emerging competition and falling prices" that the Fact Sheet describes.[10] Cable companies in particular, "with their already ubiquitous networks,"[11] "have emerged as significant suppliers of [business data services]."[12] There has been no showing, and no finding, that ILECs in particular have market power in any market, much less every market.

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[4] *See id.*, at 3.

[5] *Id*.

[6] William Baumol & Gregory Sidak, *The Price of Inputs Sold to Competitors*, 11 Yale J. on Reg. 171, 178 (1994).

[7] *See* Windstream Reply Comments, WC Docket Nos. 16-143, *et al*. (Aug. 9, 2016) ("Windstream Reply Comments"), at Attachment B, Declaration of Robert D. Willig, ¶ 20 ("Willig Decl.").

[8] *See id.*, ¶¶ 4-6.

[9] *See id*. ¶ 5 ("For purposes of this declaration, I am accepting as given the findings by Dr. Marc Rysman that incumbent local exchange carriers ('ILECs') possess and exercise market power with respect to business data services below 50 Mbps, and the findings by Drs. Jonathan Baker and John Kwoka that ILECs also poses market power with respect to business data services up to at least 1 Gbps in at least some geographic areas.").

[10] Fact Sheet, at 2.

[11] *Id*.

[12] *Business Data Services in an Internet Protocol Environment*, Tariff Investigation Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 4723, ¶ 59 (2016) ("*FNPRM*").

II. Facilities-Based Competition for Ethernet Undermines Windstream's Arguments

The economic welfare arguments that Dr. Willig presents to support Windstream's proposal do not apply to ILECs that face facilities-based competition, including increasing competition from cable providers.[13] Dr. Willig's argument that a small or negative margin between ILECs' wholesale and retail Ethernet prices harms economic welfare necessarily relies upon some theory of an exclusionary or predatory price squeeze.[14] Such a price squeeze implies that ILEC prices in the retail market, the wholesale market, or both, deviate from profit-maximizing prices. In other words, an ILEC would incur a loss or sacrifice some short-run profit to exclude a competitor from the market or to discourage investment by a competitor.[15] That sacrifice of short-run profit is only optimal for a firm if it can recoup those losses, including a normal rate of return, in the long-run.

But with facilities-based competition for Ethernet services, it is unrealistic that ILECs could recoup those losses. Communications networks tend to have high fixed costs and low marginal costs. Business data services providers therefore have strong incentives to compete for each business consumer. Thus, even if an ILEC theoretically could prevent entry or investment by another provider or induce its exit through a margin squeeze, the ILEC would be unable to recoup its losses from the margin-squeeze strategy because of facilities-based competition from cable and other providers.

III. Windstream Misapplies Its Theory and Misstates the Efficient Wholesale Price Under Its Own Proposal.

Even if the pricing theory underlying Windstream's proposal were relevant to the Ethernet marketplace, both Windstream and Dr. Willig misapply it. To make sense, the ECPR theory requires taking into account all of a provider's opportunity costs of providing wholesale service—that is, the value of the best alternative use of the wholesale infrastructure and other inputs.[16]

Windstream fails to take into account the full range of these opportunity costs.[17] Dr. Willig in his declaration does incorporate one component of the ILEC's opportunity cost of providing wholesale Ethernet access—the retail margin that the ILEC forgoes by providing wholesale service—but he incorrectly fails to consider how losing a retail customer could affect the ILEC's revenue from products complementary to retail Ethernet services. By providing

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[13] *See* Sidak Decl. ¶¶ 18-20.

[14] *See id.* ¶ 16–17.

[15] *See id.* ¶ 16.

[16] *See, e.g.*, J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES 286–87 (Cambridge Univ. Press 1997); WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY 99–101 (MIT Press & AEI Press 1994).

[17] *See* Sidak Decl. ¶¶ 21-29.

wholesale Ethernet service to a competitor instead of retail service to the customer, the ILEC may lose the retail customer's business for those complementary products. Thus, an ILEC's opportunity cost of losing the customer account is not limited to the net revenues earned on Ethernet service. Instead it encompasses the net revenues that the ILEC could earn on a wide range of services targeted at that customer, currently and in the foreseeable future.

This fundamental misunderstanding of an ILEC's opportunity cost invalidates Windstream's argument that the theoretical efficient retail price must always exceed the theoretical efficient wholesale price. For example, if the additional opportunity cost not captured by the retail margin exceeds the ILEC's avoided cost, then its *net* avoided cost will be negative.[18] It is that net avoided cost that a proper ECPR analysis would subtract from the ILEC's retail price to yield an efficient wholesale price. And an ILEC potentially could lose so much revenue from complementary services when it loses a retail Ethernet customer to a competitor using its network, and avoid so little cost by not providing retail service, that the theoretical efficient wholesale price under ECPR actually would exceed the efficient retail price.

That insight has important implications for investment incentives. Professor Willig claims that capping wholesale Ethernet prices at retail price less avoided cost "does not suppress incentives for investment by the monopolist or duopolist" because "a price satisfying ECPR provides the bottleneck owner the same dollar margin from the wholesale sale of the critical input as the bottleneck owner would earn from the sale of the retail service."[19] But, if the ILEC's opportunity cost exceeds its retail margin from Ethernet services, limiting wholesale margin to the ILEC's retail margin on that individual product can actually dampen incentives for investment, contrary to the Commission's goals.

Where carriers can purchase facilities from rivals at heavily discounted rates, they are more likely to do so than to build facilities themselves, even though the Fact Sheet states "revenues from high-bandwidth offerings enable competitive LECs (CLECs) to deploy their own networks to serve the most attractive customers."[20] And the Fact Sheet states that the draft Order already proposes to "ensur[e] just and reasonable prices" through its proposed framework.[21] A wholesale discount on top of that proposed framework is unnecessary, and it could encourage arbitrage instead of promoting investment and innovation.

IV. Windstream's Proposed Parity Pricing Rule Is Unworkable.

Windstream's proposed rule would require a far-reaching inquiry into the "retail costs avoided by the business data service provider[] . . . in provisioning the business data service to a retail customer."[22] Windstream does not propose a full list of these costs, but it says it at least

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[18] *See, e.g.,* J. Gregory Sidak, *Abolishing the Price Squeeze as a Theory of Antitrust Liability*, 4 J. COMPETITION L. & ECON. 279, 301–03 (2008).

[19] Willig Decl. ¶ 26.

[20] Fact Sheet at 2.

[21] *Id*.

[22] Windstream Oct. 6, 2016 Ex Parte at Attachment, Proposed Rule (d) ("Proposed Rule").

includes the costs of “network resources and facilities,” “salaries, benefits and other compensation and expenses for personnel,” “advertising, promotional, marketing, administrative, and other planning and operational expenses,” and “uncollectable charges to retail customers for business data services.”[23] Even assuming the Commission could reliably determine these costs, it would require business data service providers to conduct massive cost studies, which the Commission has repeatedly found are burdensome.[24] And many of the critical elements of these studies would be arbitrary.

For example, Verizon’s wholesale and retail operations for business data services share many of the same network resources and facilities, which are sized to meet the demand for both types of offerings. There is no reliable way to allocate these costs solely to wholesale operations or determine the incremental cost of providing a facility on a wholesale basis. Moreover, as Dr. Willig acknowledges, there are some wholesale costs that are not incurred for retail operations, such as for a Network-to-Network interface.[25]

Windstream assumes that wholesale and retail operations are easily divisible and distinguishable because it incorrectly claims that providing wholesale and retail services are fundamentally very different. Dr. Willig claims without support that “the wholesale provider’s carrier sales operation is much streamlined—and automated—because the wholesale provider does not have to help the retail customer design and implement its overall communications solution.”[26] But how providers offer wholesale and retail services is more similar than different, including how they help customers determine the services that will best meet their needs.[27] The sale of wholesale business data services requires considerable coordination between Verizon and the customer. And that means two things: First, it’s not easy to distinguish “wholesale” and “retail” costs, and second, there’s no good reason to assume it is efficient to mandate a “discount” for “wholesale” services because it may be that the costs are similar.

Windstream’s proposal not only would require a far-reaching inquiry into costs, but also into prices. Windstream’s proposed rule states that a wholesale charge “shall not exceed the lowest business data service charge offered to a retail customer for substantially equivalent

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[23] Proposed Rule (d)(1)-(4).

[24] *See Separation of Costs of Regulated Telephone Service from Costs of Nonregulated Activities*, Order on Reconsideration, 2 FCC Rcd 6283, ¶ 146, n.218 (1987) (“Use of an average schedule eliminates the necessity of conducting expensive and burdensome cost studies.”); *Policy and Rules Concerning Rates for Dominant Carriers*, Second Report and Order, 5 FCC Rcd 6786, ¶ 270 (1990) (establishing “procedures [that] are intended to reduce the need for costly and burdensome cost studies that are normally required to establish access rates upon leaving NECA pools”).

[25] *See* Willig Decl. ¶ 28.

[26] *Id*. ¶ 30.

[27] *See, e.g.*, Verizon Comments, WC Docket Nos. 16-143, *et al*., at Exhibit A, Declaration of Daniel Higgins (June 28, 2016); Verizon Reply Comments, WC Docket Nos. 16-143, *et al*., at Appendix A, Declaration of Jerry Holland and Daniel Higgins (Aug. 9, 2016).

connectivity, including of all discounts and credits." [28] But determining retail prices in this context is complex and difficult given that retail business data services are often sold not on a stand-alone basis, but packaged together with other offerings.[29] Windstream offers no guidance, much less a workable solution, for how to isolate and compare wholesale and retail prices for similar services. Dr. Willig himself acknowledges that no such information currently exists, and instead he urges the Commission to identify it.[30] Contrary to what Dr. Willig appears to assume, however, identifying that information is no simple task, nor one that the Commission can accomplish based on the notice and record in this proceeding.

Likewise, ILECs often sell bundles of services, including bundles with several customized services. When the only observable prices are for bundles that each contain different custom products, how does one identify the retail price of some subset of that bundle? Ultimately, it would be very difficult, if not impossible, to reliably identify appropriate retail Ethernet prices on which to base wholesale discounts.

And it is no answer to adopt Windstream's proposal that "a business data service provider may utilize an interim safe harbor of 18 percent in lieu of calculating retail costs avoided in accordance with subsection (d)."[31] This figure is based on Windstream's own cost structure,[32] and there is no reason to assume that Windstream's cost structure represents other ILECs or the industry as a whole.

V. Windstream's Proposal Conflicts With the Commission's Key Objectives.

Windstream's proposed wholesale pricing rule conflicts with the Commission's key objectives in revamping the regulation of Ethernet services. The Commission has said its "ultimate goal going forward is to apply regulatory obligations on a technology and provider neutral basis where it is necessary to protect and promote competition."[33] Windstream's proposal, by contrast, singles out ILECs for prescriptive price regulation. The Commission seeks to "discard[] the traditional classification of 'dominant' and 'nondominant carriers."[34] Yet Windstream's proposal assumes that ILECs are dominant in providing Ethernet services throughout the country. The Commission favors "large scale de-regulation."[35] But Windstream proposes extensive new regulation, including a new wholesale pricing standard that would

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[28] Proposed Rule (c).

[29] *See* Sidak Decl. ¶¶ 30-31.

[30] Willig Decl. ¶ 41 ("the FCC should publicly identify the relevant information and best evidence for assessing the levels of prices for the bottleneck services that are implicitly charged by the ILECs to their own retail customers.").

[31] Proposed Rule (e).

[32] *See* Windstream Comments, WC Docket Nos. 16-143, *et al*., at 43(June 28, 2016).

[33] *FNPRM*, ¶ 270.

[34] *Id.* ¶ 4.

[35] *Id.*

require extensive cost studies and pricing data to implement. In fact the Commission has never mandated a wholesale discount for business data services, including the legacy special access services the Commission has regulated much more heavily than Ethernet services. And whereas the Commission favors "tailored rules where competition does not exist,"[36] Windstream's proposal relies on sweeping generalizations about market conditions.

Instead of creating a new regulatory requirement based on blanket, unfounded assumptions, the Commission should take a light-touch, targeted approach to ensuring reasonably priced retail and wholesale Ethernet services. The complaint-based approach described in the Fact Sheet is one way to do that. Under that framework, if there is a concern about pricing in a specific market, the Commission can address it through the section 208 complaint process. In fact that proposal is more consistent with Dr. Willig's observations that ECPR depends on actual facts. By contrast, Windstream's overbroad remedy would cure many areas where the facts—and Dr. Willig's own analysis—show healthy markets.

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Windstream's proposal for a wholesale discount for Ethernet service has no support in the facts or the law, and the Commission should reject it.

Very truly yours,

Attachment

[36] *Id.*

ATTACHMENT A

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Business Data Services in an Internet Protocol Environment	)	WC Docket No. 16-143
	)	
Special Access for Price Cap Local Exchange Carriers	)	WC Docket No. 05-25
	)	
AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services	)	RM-10593

DECLARATION OF J. GREGORY SIDAK
ON BEHALF OF VERIZON

October 31, 2016

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EXECUTIVE SUMMARY

1. In May 2016, the Commission issued a further notice of proposed rulemaking inviting "comment on a number of proposals to establish a new regulatory paradigm" for business data services (BDS), which include Ethernet services.[1] In response, Windstream Services, LLC (Windstream) submitted comments urging the Commission to promulgate a rule requiring an incumbent local exchange carrier (ILEC) to maintain a minimum margin between the retail price that it charges business data customers for Ethernet service and the wholesale price that the ILEC charges a competitive local exchange carrier (CLEC) for access to that service.[2] Supported by the expert declaration of Professor Robert Willig, Windstream proposed a minimum wholesale-retail margin equal to the costs that the ILEC avoids by selling wholesale rather than retail Ethernet services.[3]

2. Verizon has asked me to evaluate Professor Willig's declaration and opine on the economic implications of his proposal to regulate the wholesale-retail margin of Ethernet services. I identify here several problems with Professor Willig's proposed pricing rule, as well as problems in general with regulating the minimum wholesale-retail margin for Ethernet services.

1. Tariff Investigation Order and Further Notice of Proposed Rulemaking, WC Dkt. Nos. 16-143, 15-247, 05-25, RM-10593, ¶ 159, at 68 (F.C.C. Apr. 28, 2016) [hereinafter Further Notice].

2. Reply Comments of Windstream Services, LLC on the Further Notice of Proposed Rulemaking, WC Dkt. Nos. 16-143, 05-25, RM-10593, at 28–29 (F.C.C. Aug. 9, 2016) [hereinafter Windstream Reply Comments].

3. *Id.*; Declaration of Robert D. Willig, Business Data Services in an Internet Protocol Environment, WC Dkt. Nos. 16-143, 05-25, RM-10593 (F.C.C. Aug. 8, 2016) (on behalf of Windstream Services, LLC) [hereinafter Willig Declaration].

3. Professor Willig presents his proposed wholesale-discount rule as a top-down version of the efficient component pricing rule (ECPR).[4] However, in my opinion the welfare arguments that he uses to support his wholesale-discount rule are unpersuasive when facilities-based competition (from a cable operator or facilities-based CLEC, for example) disciplines an ILEC's retail prices, because the access input in question ceases to be the "bottleneck" facility that motivated the ECPR. Moreover, even in the case of a true vertically integrated access monopolist, Professor Willig's modified ECPR is incomplete in the critical respect that it ignores the effect of demand complementarity on the ILEC's opportunity cost of providing wholesale access to Ethernet service. An ILEC is a multiproduct firm, not a single-product firm. Professor Willig's rule for regulating the ILEC's wholesale-discount margin neglects to incorporate the ILEC's forgone net revenue from selling multiple products that are, for business data customers, complements in demand to Ethernet service. His modified ECPR thus relies—implicitly and contrary to fact—on the assumption that an ILEC is a single-product firm. As a consequence, applying Professor Willig's wholesale-retail margin rule to Ethernet services supplied by a multiproduct ILEC would not deliver the efficiency benefits of the ECPR but instead would distort competition in the provision of retail Ethernet services and other business data services.

4. If it were to accept Professor Willig's proposed wholesale-discount rule in theory, the Commission soon would find itself unable in practice to identify reliably the inputs needed to implement the rule. In particular, an ILEC's sale of Ethernet services in customized contracts will likely contain other customized services that would significantly complicate the Commission's task of measuring the minimum wholesale discount that Professor Willig would require for Ethernet services. The distortionary effects on competition of the Commission's

4. Willig Declaration, *supra* note 3, ¶ 20, at 8–9.

mandating unreliably identified wholesale discounts would outweigh any putative benefit from their application.

QUALIFICATIONS

5. My name is J. Gregory Sidak. I base the opinions contained in this declaration on my education, my experience, and my analysis of the facts of this proceeding.

6. I am the chairman of Criterion Economics, LLC in Washington, D.C. I am also the founding co-editor of the *Journal of Competition Law & Economics*, which the Oxford University Press has published quarterly since 2005. I have worked at the intersection of law and economics for 35 years.

7. I earned A.B. (1977) and A.M. (1981) degrees in economics and a J.D. (1981), all from Stanford University. As an undergraduate student, I was awarded the departmental prize for best honors thesis in economics at Stanford in 1977. As a graduate student, I was a member of the *Stanford Law Review* and a research assistant at the National Bureau of Economic Research (NBER) and the Hoover Institution.

8. I have served in the federal government of the United States on three occasions. In 1981, I became Judge Richard Posner's first law clerk on the U.S. Court of Appeals for the Seventh Circuit. From 1986 to 1987, I was Senior Counsel and Economist to the Council of Economic Advisers (CEA) in the Executive Office of the President. There, my responsibilities involved drafting portions of the *Economic Report of the President*, including President Ronald Reagan's introduction to the 1987 *Report*. I represented the CEA in working group meetings of the Economic Policy Council concerning regulatory, antitrust, and intellectual property policy. From 1987 to 1989, I was Deputy General Counsel of the Federal Communications Commission.

9. From 2009 to 2014, I was the Ronald Coase Professor of Law and Economics at Tilburg University in the Netherlands. From 1992 through 2005, I was a resident scholar at the American Enterprise Institute for Public Policy Research (AEI), where I held the F.K. Weyerhaeuser Chair in Law and Economics and directed AEI's Studies on Telecommunications Deregulation. From 1993 to 1999, while at AEI, I was also a Senior Lecturer at the Yale School of Management, where I taught courses with Dean Paul W. MacAvoy on regulation and competitive strategy in the telecommunications sector. From 2005 to 2007, I was a Visiting Professor of Law at Georgetown University Law Center, where I taught courses on telecommunications regulation and antitrust law. In addition to having held these academic positions, I have practiced law with Covington & Burling and O'Melveny & Myers and have worked as a management consultant with the Boston Consulting Group.

10. Since 1980, I have published six books and more than 100 articles in scholarly journals and compilations. My writings have been downloaded more than 62,000 times from the Social Science Research Network and have been published in the *Journal of Political Economy*, the *American Economic Association Papers & Proceedings*, the *Columbia Law Review*, the *Stanford Law Review*, the *University of Chicago Law Review*, the *Yale Law Journal*, and many other scholarly journals. The Supreme Court of the United States, the Supreme Court of Canada, and the European Commission have cited my writings approvingly. I have testified before committees of Congress on multiple occasions. My essays have appeared in the *New York Times*, the *Wall Street Journal*, and many other newspapers and business periodicals.

11. I have researched and written extensively about access pricing in telecommunications since the early 1990s. I have co-authored two books that analyze access pricing in the U.S. telecommunications industry: one with William Baumol and one with Daniel

Spulber.[5] I have published numerous articles on access pricing, including an analysis of the option-value theory of access pricing in telecommunications co-authored with Jerry Hausman and published in the *Yale Law Journal*, and an analysis of the use of the efficient component pricing rule in telecommunications co-authored with William Baumol and published in the *Yale Journal on Regulation*.[6]

12. I have served clients as a consulting or testifying economic expert in adversarial matters throughout the Americas, Europe, Asia, and the Pacific. I have advised many telecommunications and media clients on antitrust and regulatory matters, including América Móvil, AT&T, Bell Canada, BT, Cable & Wireless, CTIA—The Wireless Association, Deutsche Telekom, Disney, eircom, KPN, Nippon Telegraph & Telephone, NTT DoCoMo, Tata, Telecom Corporation of New Zealand, Teléfonos de México, Telstra, U.S. Telecom Association, Verizon, Verizon Wireless, and Vodafone. I have also served as a consultant to government agencies, including the Antitrust Division of the U.S. Department of Justice and the Competition Bureau in Canada. In addition, since 2013, I have twice served as Judge Posner's court-appointed neutral economic expert pursuant to Federal Rule of Evidence 706. Apart from undertaking these consulting engagements, I served from 2002 to 2006 as a member of the U.S. advisory board for NTT DoCoMo, Japan's largest wireless telecommunications operator, and in that capacity briefed DoCoMo's chairman semiannually on the business implications of emerging regulatory and antitrust trends in telecommunications.

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5. J. GREGORY SIDAK & DANIEL F. SPULBER, DEREGULATORY TAKINGS AND THE REGULATORY CONTRACT: THE COMPETITIVE TRANSFORMATION OF NETWORK INDUSTRIES IN THE UNITED STATES (Cambridge Univ. Press 1997); WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY (MIT Press & AEI Press 1994).

6. Jerry A. Hausman & J. Gregory Sidak, *A Consumer-Welfare Approach to the Mandatory Unbundling of Telecommunications Networks*, 109 YALE L.J. 417 (1999); William J. Baumol & J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors*, 11 YALE J. ON REG. 171 (1994).

13. I attach as Appendix I to this report my current *curriculum vitae*, which lists my expert economic testimony in matters of public record.

I. A Brief Overview of Ethernet Services

14. BDS provide a "dedicated point-to-point transmission of data at certain guaranteed speeds and service levels using high-capacity connections."[7] Unlike "best efforts" broadband services, BDS provide dedicated symmetrical transmission speeds (that is, equal upload and download speeds) and performance guarantees, such as traffic prioritization or service availability guarantees.[8] Businesses—as well as large organizations such as government entities, hospitals, and universities—use BDS to "create their own private networks and to access other services such as Voice over IP (VoIP), Internet access, television, cloud-based hosting services, video conferencing, and secure remote access."[9]

15. Ethernet service is an advanced form of BDS that allows subscribers to create a private virtual network over a wide geographic area and to send information using packet-based protocol between multiple subscriber sites.[10] The bandwidth of Ethernet services ranges from 1 Mbps to 100 Gbps[11] and is more scalable than the bandwidth of legacy circuit-based technologies, such as Time-Division Multiplexing (TDM).[12] The Commission classifies packet-

7. Further Notice, *supra* note 1, ¶ 12, at 6.
8. *Id.* ¶ 13, at 6.
9. *Id.* ¶ 12, at 6.
10. *Id.* ¶¶ 45–47, at 21–22; *40th Anniversary of Ethernet Celebration*, INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS [IEEE], http://standards.ieee.org/events/ethernet/index.html.
11. *802.3-2015—IEEE Standard for Ethernet*, IEEE, http://standards.ieee.org/findstds/standard/802.3-2015.html.
12. Further Notice, *supra* note 1, ¶ 80, at 36 ("Ethernet services, especially over fiber, scale bandwidth to meet [increased demand for high-bandwidth services] more cost effectively than legacy TDM services.").

based BDS (such as Ethernet service) as a telecommunications service subject to regulation under Title II of the Communications Act.[13]

16. In the United States, ILECs, CLECs, and cable operators supply Ethernet services to retail customers, carrier customers (wholesale customers), and mobile wireless providers.[14] Network operators typically deliver Ethernet services using fiber, coaxial cable, and copper wire.[15] Retail customers of BDS consist of mainly business, government entities, and non-profit firms, whereas wholesale customers consist of mainly CLECs that purchase wholesale BDS "as an input to supplement their own facilities-based offerings."[16] According to the Commission, Ethernet services, combined with other packet-based BDS, accounted for "[m]ore than 40 percent of the approximately $45 billion in dedicated service revenues reported for 2013."[17] Demand for Ethernet services has increased since 2013 among all three customer segments (retail, wholesale, and mobile wireless), and the Commission expects that demand to increase significantly.[18]

II. Problems with Professor Willig's Modification of the Efficient Component Pricing Rule (ECPR) to Wholesale Ethernet Access

17. Professor Willig proposes that the Commission cap ILECs' wholesale Ethernet access rates at the ILEC's retail rate less its avoided costs, applying the top-down version of the efficient component pricing rule (ECPR).[19] In this part, I identify three problems with Professor

13. *Id.* ¶ 257, at 114–15.
14. *See id.* ¶¶ 51–62, at 23–29, ¶ 70, at 32.
15. *Id.* ¶ 50, at 23, ¶ 83, at 38.
16. *Id.* ¶ 70, at 32.
17. *Id.* ¶ 81, at 37.
18. *Id.* ¶ 81, at 37–38, ¶¶ 90–91, at 41.
19. Willig Declaration, *supra* note 3, ¶¶ 6–9, at 3–5.

Willig's proposal. First, his argument that maintaining by regulation a minimum wholesale-retail margin enhances economic welfare is unpersuasive when facilities-based competition exists. Second, Professor Willig's modification of the ECPR excludes the effects of demand complementarity on the ILEC's opportunity cost of providing wholesale Ethernet access. That is, his pricing methodology does not consider the ILEC's forgone net revenue from products that the ILEC sells to the same business customer that are complementary to Ethernet services. Third, the Commission would be unable to identify reliably the inputs needed to implement Professor Willig's proposal.

A. Facilities-Based Competition Weakens Professor Willig's Welfare Arguments

18. The first significant problem with Professor Willig's analysis is its use of welfare arguments that are unpersuasive when facilities-based competition exists. He argues that a small or negative margin between an ILEC's wholesale and retail prices for Ethernet service harms economic welfare.[20] That argument necessarily relies upon some theory of an exclusionary or predatory margin squeeze. For example, in one scenario that Professor Willig presents, a facilities-based LEC supposedly could use "anticompetitively high-price[s]" for wholesale Ethernet service to "impel the exit or contraction" of its downstream competitors.[21] After the competitors exit the market for retail services, Professor Willig argues, "those with market power over the bottleneck inputs would be able to raise retail prices profitably."[22]

19. However, the anticompetitive margin-squeeze pricing strategy that Professor Willig describes would typically require the ILEC to incur some loss or to sacrifice some short-run profits. That sacrifice of short-run profit would be optimal for the ILEC only if it could raise

20. *Id.* ¶¶ 6–7, at 3–4.
21. *Id.* ¶¶ 16–17, at 7.
22. *Id.* ¶ 16, at 7.

prices to recoup those losses, including a normal rate of return, in the long run. However, facilities-based competition would likely prevent full recoupment by disciplining the ILEC's prices after a CLEC's exit. Because telecommunications networks have high fixed costs and low marginal costs, wireline providers have a strong incentive to compete for each business consumer. Thus, facilities-based competition from cable companies and existing facilities-based CLECs would prevent the ILEC from executing a profitable margin squeeze, even if the ILEC could successfully prevent entry or investment by CLECs or induce their exit.

20. It bears emphasis that even an ILEC that is more efficient than its facilities-based competitors would need to compete for consumers during the recoupment period. A less efficient competitor can discipline the ILEC's retail prices so long as those prices exceed the competitor's retail costs. It is at least debatable, and in my opinion unlikely, that an ILEC could recoup its losses from an anticompetitive margin squeeze while maintaining a price below its rivals' retail costs—even if those rivals are less efficient than the ILEC. Thus, it is implausible that the margin-squeeze strategy would be profitable, even in the presence of cost asymmetries.

B. Professor Willig's Analysis Disregards the Effect of Demand Complementarity on the ILEC's Opportunity Cost

21. A second problem with Professor Willig's modification of the ECPR is that it neglects to consider the effect of demand complementarity among the ILEC's multiple products on its opportunity cost of providing the CLEC wholesale access to Ethernet service. The ECPR is designed to include the ILEC's full opportunity cost of providing wholesale access in the price of wholesale access.[23] For an ILEC, the best alternative use of its wholesale Ethernet infrastructure is to serve a business data customer on a retail basis. However, to incorporate the ILEC's entire

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23. *See, e.g.*, SIDAK & SPULBER, *supra* note 5, at 286–87; BAUMOL & SIDAK, *supra* note 5, at 99–101.

opportunity cost into its price for supplying the CLEC wholesale Ethernet access, the Commission would also need to consider the effect that the ILEC's loss of a retail Ethernet customer would have on the demand for (and the net revenues from) the ILEC's complementary services. Professor Willig's modification of the ECPR understates the ILEC's true opportunity cost of providing wholesale access by ignoring those ancillary revenue streams associated with the ILEC's retail relationship with a given business data customer. As I explain below, an access price that compensates the ILEC for its full opportunity cost of providing the CLEC wholesale Ethernet access can exceed the ILEC's retail price for Ethernet service under plausible (and in my opinion probable) conditions.

22. Professor Willig's proposal incorporates one component of the ILEC's opportunity cost of providing wholesale Ethernet access: the retail margin on Ethernet access that the ILEC forgoes by providing wholesale service to the CLEC. However, by providing wholesale Ethernet service to a CLEC instead of supplying retail service to the business data customer, the ILEC would likely lose that customer's purchases of complementary business-data products that the ILEC offers. Consequently, an ILEC's opportunity cost of losing a given business data customer account is not limited to the net revenues that the ILEC would earn solely on its sale of Ethernet service to that customer; rather, the ILEC's full opportunity cost encompasses the net revenues that the ILEC would earn on a range of subscriber-funded or advertiser-funded services targeted at that business data customer, now and in the foreseeable future.[24]

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24. To be more precise, one could express the ILEC's forgone stream of net revenues from ancillary services as an expected value, so as to control for the fact that the ILEC's loss of such business might be less than 100 percent likely to occur.

23. If a CLEC seeks to compete with an ILEC that produces *n*+1 products over which the ILEC experiences either economies of scope in production or complementarity of demand (or both), then it would be an erroneous application of the ECPR to evaluate the ILEC's opportunity cost of providing wholesale access solely on the basis of the net retail revenues forgone from the ILEC's provision of wholesale access for the one product that both the ILEC and the CLEC produce. I do not know of any principle in telecommunications law, in public utility law, in antitrust law, in constitutional law, or in the common law of contract, property, or torts that would limit the ILEC's legal right to be compensated for the full opportunity cost across all *n*+1 products that it produces when the ILEC sells wholesale Ethernet access to a CLEC. More generally, I do not know of any legal principle that obligates an incumbent firm to ensure the financial viability of an entrant that chooses to compete by offering consumers a smaller menu of complementary products than the multiproduct incumbent offers.

24. The economic and legal significance of the preceding caveat cannot be overstated. Neither the ILEC nor the CLEC typically offers a single service to a given business data customer. By limiting the ILEC's opportunity cost to its forgone retail margin on a single product (in this instance, Ethernet service), Professor Willig's proposal implicitly imposes the assumption that both the ILEC and the CLEC operate as single-product firms. That unspoken assumption is determinative from the perspective of the CLEC's strategic use of regulation. Yet Professor Willig's tacit assumption is more than unproven; it is manifestly contrary to experience and industry practice.

25. This discontinuity between assumption and fact is significant. By imposing a single-product assumption on the ECPR in a multiproduct arena, Professor Willig can no longer ensure (as one's use of a truly comprehensive application of the ECPR to a multiproduct setting

could) that "relative success in the downstream market will be determined by the relative merits and efficiencies of downstream offerings in meeting the needs and demands of the retail consumers."[25] As his proposal acknowledges,[26] a CLEC that purchased wholesale Ethernet access would be able to (and in my opinion in most cases would) supply complementary products in addition to Ethernet services to its new retail business data customer. Yet, Professor Willig's analysis neglects to incorporate those ancillary net revenue streams into the ILEC's opportunity cost of providing the CLEC wholesale Ethernet access. Consequently, his proposal would truncate the ILEC's revenue from permitting the CLEC's use of the ILEC's Ethernet infrastructure (capping it at the ILEC's forgone revenue from sales of that single product to the business data customer in question) all while permitting the CLEC to exploit its newly acquired retail customer relationship to earn revenues from selling complementary products (in addition to the CLEC's retail Ethernet revenues).

26. Given that asymmetry, Professor Willig's single-product version of the ECPR would fail to ensure that only a CLEC that is more efficient than the ILEC (in the provision of all n+1 products that the ILEC offers to business data customers) would end up using the ILEC's Ethernet infrastructure; to the contrary, a CLEC that is less efficient than the ILEC in supplying all n+1 products could use Professor Willig's single-product version of the ECPR to set an insufficiently compensatory wholesale access price for Ethernet service that would enable the CLEC to displace the ILEC's more efficient pre-existing retail relationship with the business data customer. Thus, in my opinion the Commission's imposition of a wholesale-retail margin predicated on Professor Willig's single-product version of the ECPR would distort competition

25. Willig Declaration, *supra* note 3, ¶ 6, at 4.
26. *Id.* ¶ 18, at 7–8.

by enabling a less efficient CLEC to displace a more efficient ILEC from (1) making the retail sale of Ethernet service to the business data customer and then (2) making retail sales of the ILEC's other *n* products to that same business data customer to the extent that the customer had demand for them.

27. The proper, comprehensive understanding of the ILEC's opportunity cost disproves Professor Willig's assertion that the ILEC's efficient retail price of Ethernet service must always exceed the ILEC's efficient wholesale price. If the additional portion of the ILEC's opportunity cost that is not captured by its retail margin for Ethernet service exceeds the ILEC's avoided retail cost (in accounting terms) of supplying that service, then the ILEC's *net* avoided cost of providing wholesale Ethernet service to a CLEC would be negative.[27] Put differently, when the ILEC loses a retail Ethernet customer to a CLEC that uses the ILEC's network, it is in my opinion so likely that the ILEC would lose so much net revenue from lost sales of its *n* other services that are complementary in demand to Ethernet service, and so likely that the ILEC would avoid so little cost by ending its retail provision of Ethernet service to that particular business data customer, that the ILEC's efficient wholesale price to the CLEC would actually exceed the ILEC's efficient retail price to the business data customer.

28. Such an outcome is likely in my opinion in part because the ILEC's avoided retail costs are probably small for Ethernet services. If, as is my opinion, Ethernet services exhibit economies of scale, then the ILEC would avoid little cost by eliminating a given retail customer when it sells a unit of wholesale Ethernet access to a CLEC. Consequently, even a modest degree

27. It is that net avoided cost—or, equivalently, economic avoided cost—that a proper ECPR analysis would subtract from the ILEC's retail price to yield an efficient wholesale price. *See* J. Gregory Sidak, *Abolishing the Price Squeeze as a Theory of Antitrust Liability*, 4 J. COMPETITION L. & ECON. 279, 301–03 (2008).

of demand complementarity between Ethernet service and the ILEC's other *n* business data products could very plausibly produce a negative wholesale-retail margin for the ILEC's Ethernet service. Consider an example in which the loss of a retail Ethernet customer causes an ILEC to lose that customer's business for a single complementary service. Suppose that the ILEC avoids only a small amount of customer-care costs by converting the retail customer to a wholesale customer. The net effect of those two changes (the avoided cost of retail Ethernet sales to that given business data customer less the forgone net revenue from complementary retail sales to that same customer) could very plausibly be negative for the ILEC.

29. This insight about the efficient margin between the ILEC's retail and wholesale prices for Ethernet service has important implications for investment incentives. Professor Willig says that capping the ILEC's wholesale Ethernet price at the ILEC's retail price less its avoided cost "does not suppress incentives for investment by the monopolist or duopolist" because "a price satisfying ECPR provides the bottleneck owner the same dollar margin from the wholesale sale of the critical input as the bottleneck owner would earn from the sale of the retail service."[28] I cannot agree with that proposition for the reasons explained above. If the ILEC's opportunity cost exceeds its retail margin for Ethernet services, then limiting the ILEC's wholesale margin to its retail margin on that individual product would dampen its incentive (as well as the CLEC's incentive, for that matter) to invest in network infrastructure to support business data services.

C. Professor Willig's Proposal Is Not Feasible to Implement

30. Professor Willig's framework lacks a reliable means of isolating the retail price on which wholesale Ethernet service should be based. Because ILECs are multiproduct firms selling differentiated products, retail prices for individual services are often impossible to

28. Willig Declaration, *supra* note 3, ¶ 26, at 11.

observe directly and difficult to impute. Moreover, retail prices are particularly difficult to ascertain when an ILEC provides customized, idiosyncratic products to sophisticated customers such as to the universities and military bases that Professor Willig identifies.[29] How does one calculate a retail price for such customized services? Moreover, how does one determine which retail service corresponds to the wholesale service that an ILEC provides its competitors? For any unique product, the retail price that a CLEC (or an ILEC) would charge is a function of, among other variables, the wholesale price for the inputs necessary to supply that product. However, under Professor Willig's framework, that wholesale price is itself a function of the retail price. For customized or unique products, the inputs necessary to determine wholesale prices might not be observable.

31. Likewise, ILECs sometimes sell bundles of services, including bundles with several customized services.[30] When the only observable prices are for bundles that each contain different custom products, how does one identify the retail price of some subset of that bundle? Ultimately, it would be very difficult, if not impossible, to identify reliably the appropriate retail price for Ethernet services on which to base a wholesale discount. Mandating a wholesale discount off the retail price would likely be harmful in practice. The distortionary effects of unreliably identified wholesale discounts outweigh any potential benefit from their application.

III. CONCLUSION

32. For the foregoing reasons, I recommend that the Commission refrain from regulating the minimum wholesale-retail margin for Ethernet services.

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29. *Id.* ¶ 19, at 8.

30. *See*, *e.g.*, VERIZON, INTRODUCING VERIZON IP BUSINESS BUNDLE (2013), http://www.verizonenterprise.com/resources/factsheets/fs_introducing-verizon-ip-business-bundle_en_xg.pdf.

*   *   *

33. I declare under penalty of perjury, under the laws of the United States of America, that the foregoing is true and correct to the best of my knowledge.

Executed: October 31, 2016.

Respectfully submitted,

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October 31, 2016

Appendix I

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Stanford University, J.D., 1981; A.M. (Economics), 1981; A.B. with honors and distinction (Economics), 1977. Associate Editor, *Stanford Law Review*. Myers Prize in Economics, 1977.

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Criterion Economics, L.L.C., Washington, D.C.: Chairman, 2008–present. Founder, 1999–present.

Journal of Competition Law & Economics, published by the Oxford University Press, Oxford, United Kingdom: Founding Co-Editor, 2004–present.

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Tilburg University, Tilburg, The Netherlands: Ronald Coase Professor of Law and Economics, 2009–2014.

Georgetown University, Washington, D.C.: Visiting Professor of Law, 2005–2007.

American Enterprise Institute for Public Policy Research, Washington, D.C.: Resident Scholar and F.K. Weyerhaeuser Fellow in Law and Economics Emeritus, 2002–2005. Director, AEI Studies in Telecommunications Deregulation, 1992–1995. F.K. Weyerhaeuser Fellow in Law and Economics, 1995–2002. Resident Scholar, 1992–1995.

Yale University, New Haven, Connecticut: Senior Lecturer, Yale School of Management, 1993–2000.

Covington & Burling, Washington, D.C.: Associate, 1989–1992.

Federal Communications Commission, Washington, D.C.: Deputy General Counsel, 1987–1989.

Council of Economic Advisers, Executive Office of the President, Washington, D.C.: Senior Counsel and Economist, 1986–1987.

The Boston Consulting Group, Inc., Los Angeles: Management Consultant, 1984–1986.

O'Melveny & Myers, Los Angeles: Associate, 1982–1984.

U.S. Court of Appeals for the Seventh Circuit, Chicago: Law Clerk to Judge Richard A. Posner, 1981–1982.

Corporate Boards

NTT DoCoMo, Tokyo, Japan: Member, U.S. Advisory Board, 2002–2006.

Authored Books

Broadband in Europe: How Can Brussels Wire the Information Society, co-authored with Dan Maldoom, Richard Marsden, and Hal J. Singer (Springer 2005).

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Bar Admissions

California (1982); District of Columbia (1989); Supreme Court of the United States (1989).

Memberships

The American Law Institute

The London Court of International Arbitration, North American Users' Council

World Intellectual Property Organization, Neutral Expert

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